

Cutaneous wounds & veterinary dermatology: challenges & developments over 25 years

- The bacteria
- Emergence of antimicrobial resistance
- Focus – the staphylococci

David H. Lloyd

Dept. of Clinical Sciences & Services

Royal Veterinary College

University of London

I have no conflicts of interest relating to this presentation

25 years – 1996 - 2021

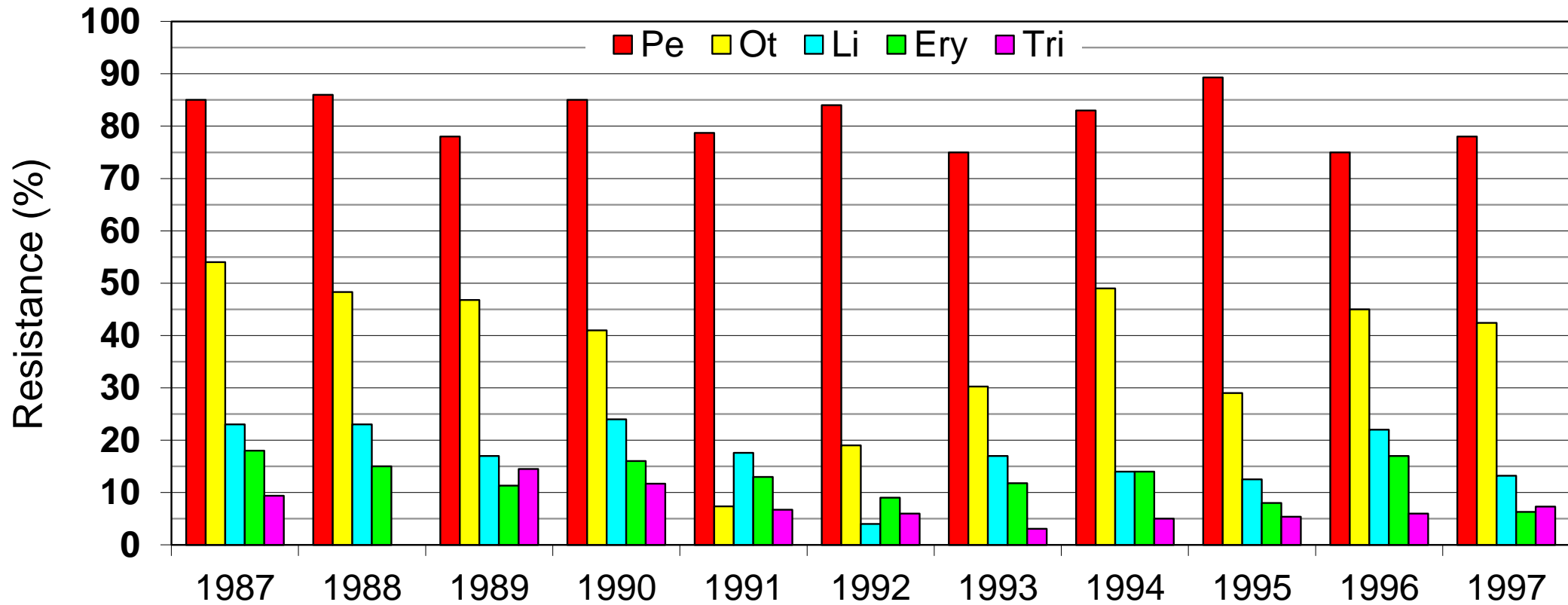
The Early Years

- 1980s - early 2000s - in human & veterinary medicine

Complacency

- Failure to carefully monitor wounds →
 - Underreporting of poor healing & chronic infection →
 - Persistence of poor hygiene procedures
 - Failure to implement infection control guidelines
 - Little recognition of the need for antimicrobial stewardship

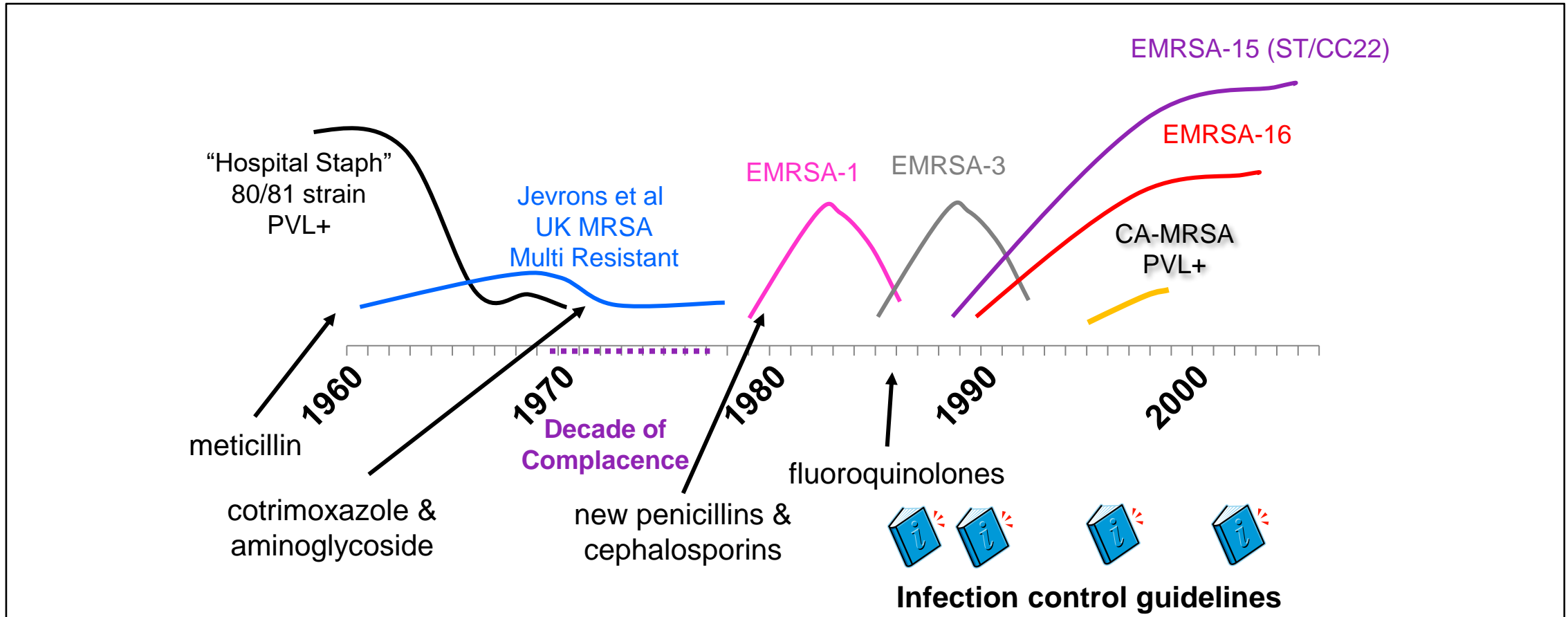
Antimicrobial Resistance: presumptive *S. intermedius*: U.K., 1987-98 (RVC data: 2,296 isolates) Lloyd & Lamport 1998



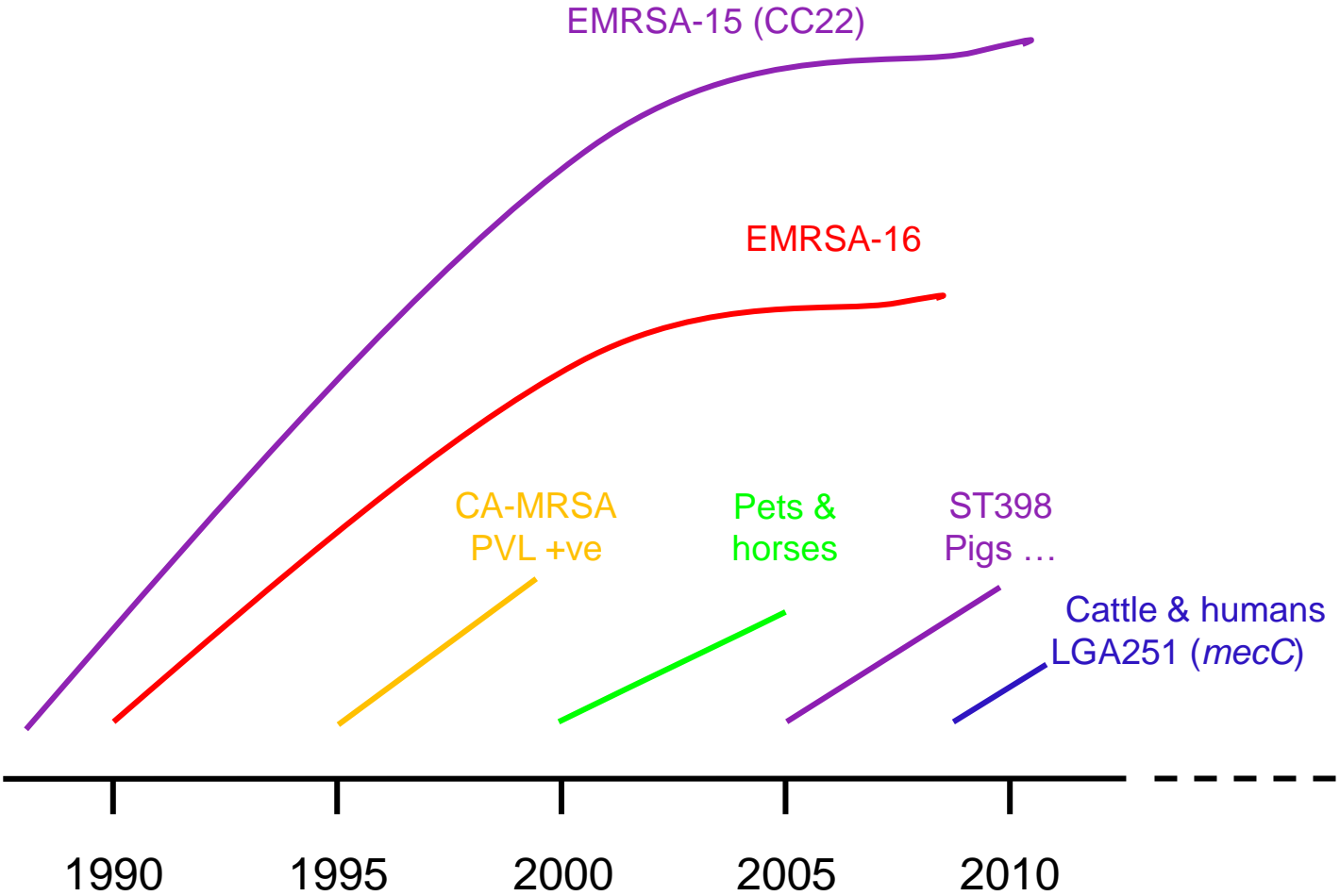
No resistance to co-amoxiclav, oxacillin, meticillin.

c. 3% resistance to co-amoxiclav in 2002-2003 (692 isolates)

A “potted history” of UK MRSA



The MRSA Story Continues



MRSA ST398 (CC398)

- Evolved in Dutch pigs in 2004 from human *S. aureus* possibly driven by use of tetracyclines
- Became worldwide in livestock, poultry, dogs, cats
 - New equine & human-adapted strains emerging
 - Relatively low virulence
- Human infections linked to farming with:
 - direct & indirect transmission
 - Community-A & HA infections



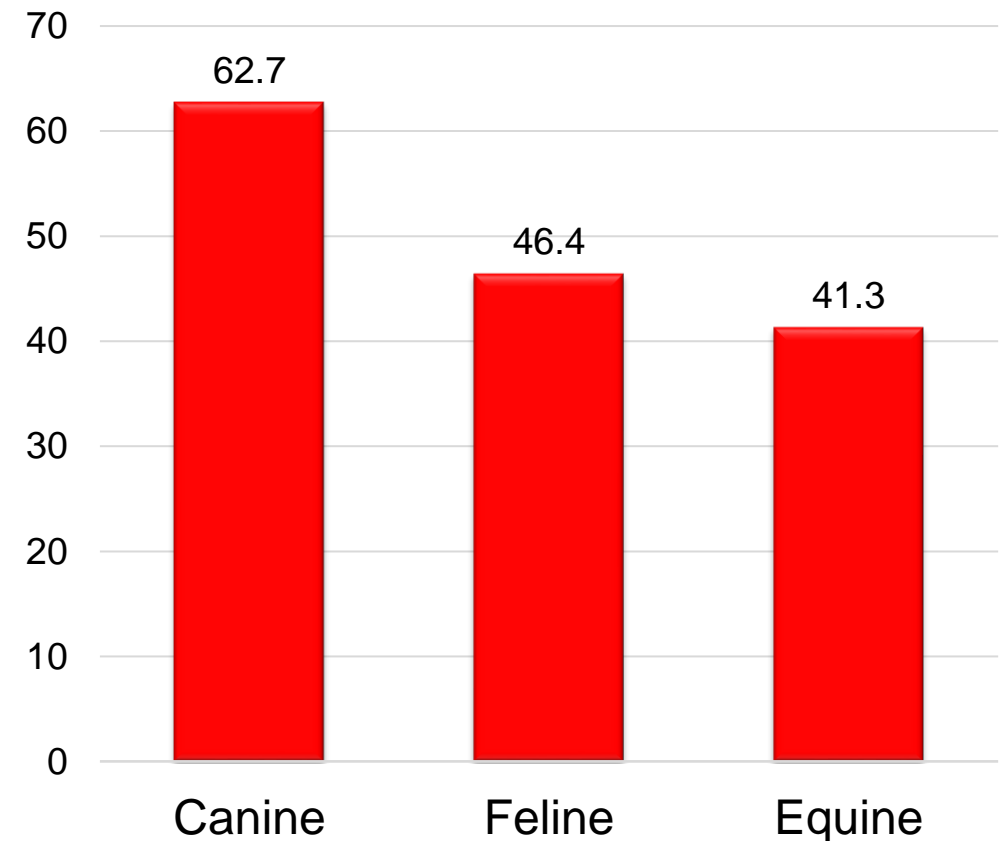
Voss A et al. Methicillin-resistant *Staphylococcus aureus* in pig farming.
Emerg Infect Dis. 2005;11 (12): 1965-1966

Vincze et al. Alarming proportions of methicillin-resistant *Staphylococcus aureus* (MRSA) in wound samples from companion animals, Germany 2010-2012. *PLoS One*. 2014; 20; 9 (1): e85656.

Survey 2010-12

- 5,229 animal wound samples from 1,170 vet practices
- *S. aureus*
 - In 5.8% canine, 12.2% feline
 - 22.8% equine swabs

MRSA in Wound Isolates (%)

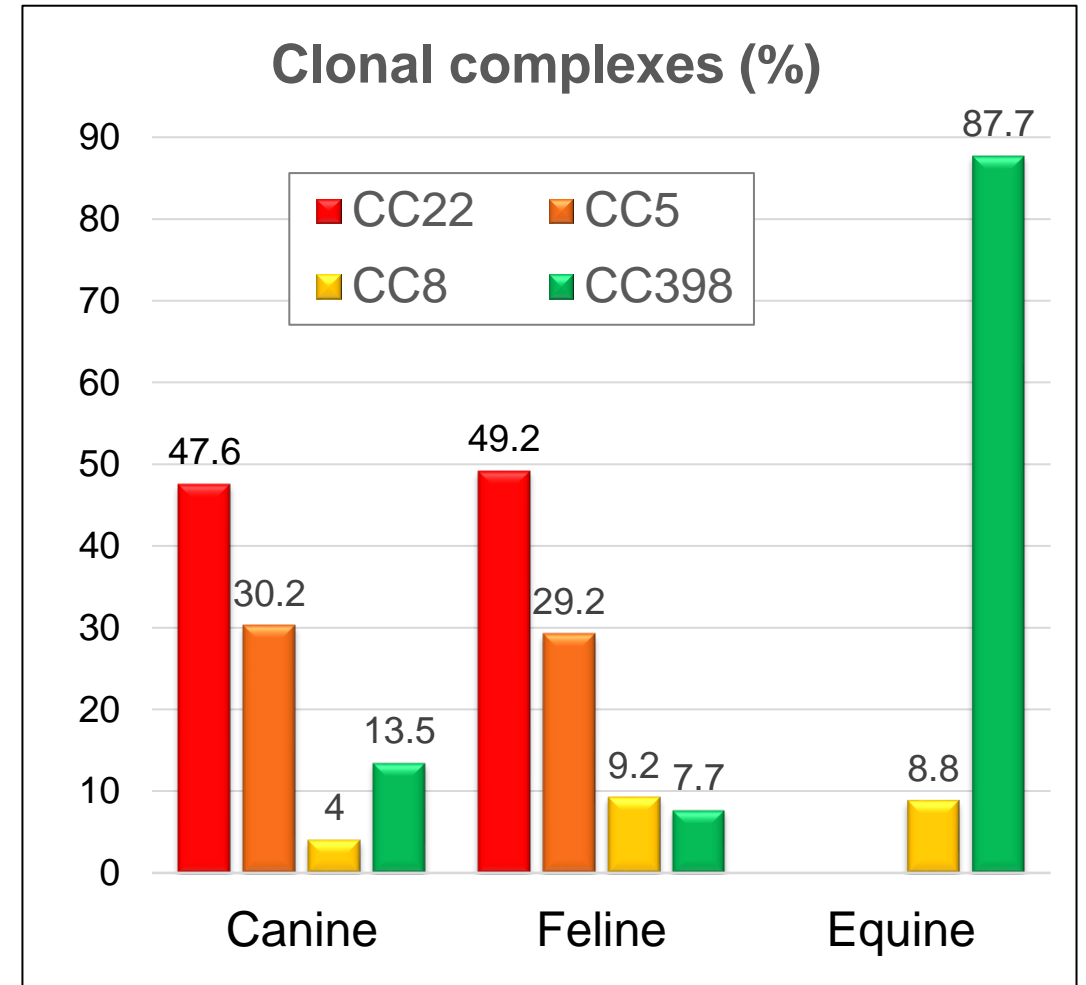


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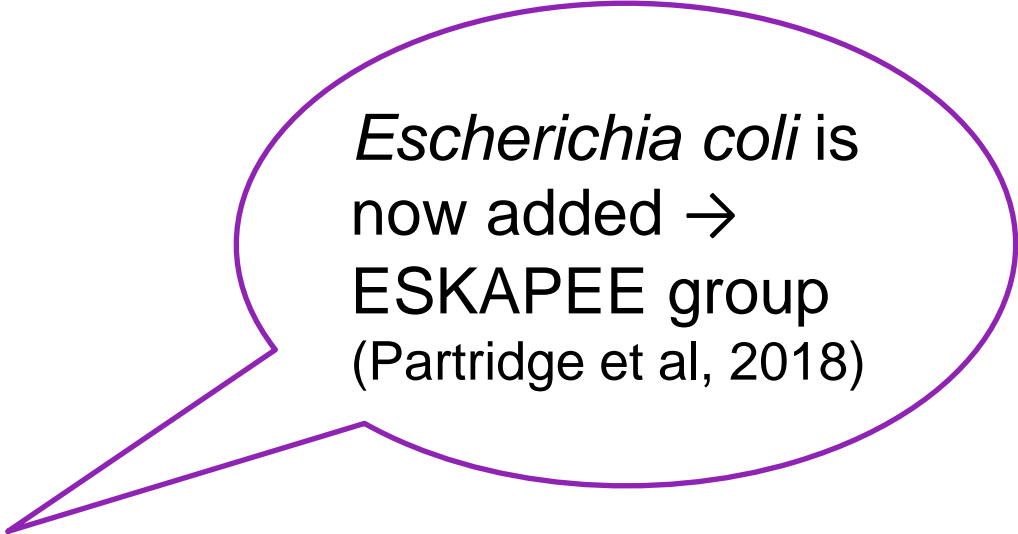
Walther et al. Equine Methicillin-Resistant Sequence Type 398 *Staphylococcus aureus* (MRSA) Harbor Mobile Genetic Elements Promoting Host Adaptation. *Front Microbiol*. 2018; 9: 2516.



The **ESKAPE** pathogens (Rice, 2008)

“representing new paradigms in pathogenesis, transmission & multiresistance”
(Pendleton et al, 2013)

- *Enterococcus faecium*,
- *Staphylococcus aureus*,
- *Klebsiella pneumoniae*,
- *Acinetobacter baumannii*,
- *Pseudomonas aeruginosa*
- *Enterobacter* spp.
- ❖ Coagulase-negative staphylococci
- ❖ Meticillin-resistant *Staphylococcus pseudintermedius* (MRSP)



Escherichia coli is now added →
ESKAPEE group
(Partridge et al, 2018)

The Golden Age of Microbiology



Emerging
Antimicrobial
Resistance

Diagnosis

Isolate/identify

- ✓ Pathogens
- ✓ Commensals ...

Antimicrobial sensitivities

Wound
microbiota

Therapy

Systemic AMD

Topical AMD

Microbe mediated
defence

Biological agents

Thank you very much

2046

Exciting
possibilities in
the next 25 years

2021